

Student: _____
Date: _____

Instructor: Krystin Manguba-Glover
Course: ACMAT 117: Manguba-Glover Fall 2024

Assignment: Midterm 1 Practice Problems - Version 3 (ONE of 3 is REQUIRED)

1. Find the mean of the set of data. Round to the nearest tenth.

103, 44, 33, 33, 44, 103, 1, 1, 1, 103, 1, 1, 33

- A. 38.9
 B. 38.5
 C. 41.7
 D. 39.0

2. Find the median of the set of data.

89, 83, 209, 127, 258, 240, 233

- A. 127
 B. 178
 C. 233
 D. 209

3. Find the domain and range of the relation.

$\{(4, -7), (-5, 2), (-3, -4), (5, 7), (12, -6)\}$

- A. $D = \{12, -6, 5, 7, 4\}$; $R = \{-7, -5, 2, -3, -4\}$
 B. $D = \{-6, 7, -7, 2, -4\}$; $R = \{12, 5, 4, -5, -3\}$
 C. $D = \{12, 5, 4, -5, -3\}$; $R = \{-6, 7, -7, 2, -4\}$
 D. $D = \{-7, -5, 2, -3, -4\}$; $R = \{12, -6, 5, 7, 4\}$

4. Find the domain and range of the relation.

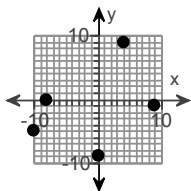
$\{(2, 5), (4, -6), (-5, 2), (-2, -3)\}$

- A. $D = \{2, 5, -6, -3\}$; $R = \{-5, 2, 4, -2\}$
 B. $D = \{-5, 2, 4, -2\}$; $R = \{2, -5, 5, -6, -3\}$
 C. $D = \{-5, 2, 4, -2\}$; $R = \{2, 2, 5, -6, -3\}$
 D. $D = \{-5, 2, 4, -2\}$; $R = \{2, 5, -6, -3\}$

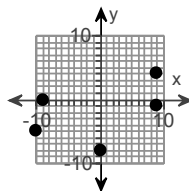
5. Plot the relation in the xy-plane.

$\{(0, -9), (4, 9), (-8, 0), (-5, -10), (-1, 9)\}$

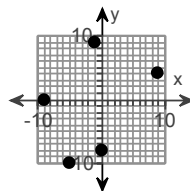
A.



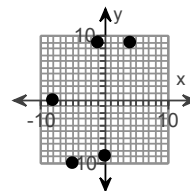
B.



C.



D.



6. Find the distance in the xy -plane between the two points. Round an approximate result to the nearest hundredth.

$(-4, -1)$ and $(2, -10)$

- A. 10.82
 B. 39.00
 C. 36.00
 D. 10.39

7. Find the midpoint of the line segment joining the two points.

$(-3, 2)$ and $(-5, 6)$

- A. $(-4, 4)$
 B. $(2, -4)$
 C. $(1, -2)$
 D. $(-8, 8)$

8. Find the center and radius of the circle.

$$x^2 + (y - 7)^2 = 4$$

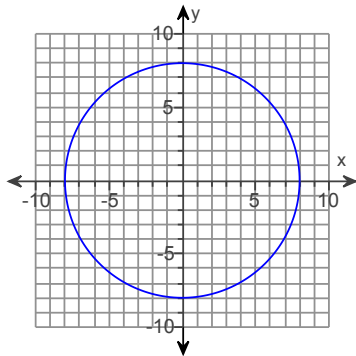
- A. Center: $(0, 7)$, radius = 2
 B. Center: $(0, -7)$, radius = 2
 C. Center: $(0, 7)$, radius = 4
 D. Center: $(7, 0)$, radius = 2

9. Find the center and radius of the circle.

$$x^2 + y^2 + 6x - 16y + 73 = 64$$

- A. $(3, -8)$, $r = 64$
 B. $(8, -3)$, $r = 8$
 C. $(-3, 8)$, $r = 8$
 D. $(-8, 3)$, $r = 64$

10. Use the graph to find the standard equation of the circle.



- A. $x^2 + y^2 = 36$
 B. $x^2 + y^2 = 64$
 C. $x^2 + y^2 = 8$
 D. $x^2 + y^2 = 16$

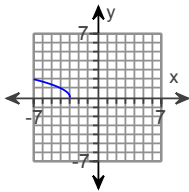
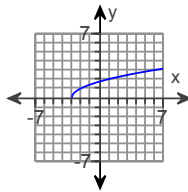
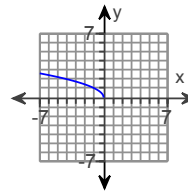
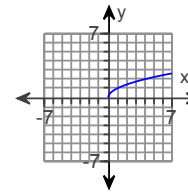
11. Find the standard equation of the circle that satisfies the conditions.

Center $(-2, 5)$, radius $\sqrt{6}$

- A. $(x + 2)^2 + (y - 5)^2 = 6$
- B. $(x + 5)^2 + (y - 2)^2 = 36$
- C. $(x - 5)^2 + (y + 2)^2 = 36$
- D. $(x - 2)^2 + (y + 5)^2 = 6$

12. Graph f by hand by first plotting points to determine the shape of the graph.

$f(x) = \sqrt{x}$

- A. 
- B. 
- C. 
- D. 

13. Find $f(5)$ when $f(x) = \sqrt{3x + 2}$.

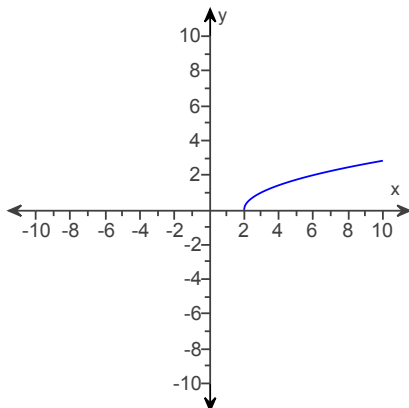
- A. $\sqrt{17}$
- B. $\sqrt{11}$
- C. $\sqrt{7}$
- D. $\sqrt{5}$

14. Specify the domain of the function.

$f(x) = \sqrt{19 - x}$

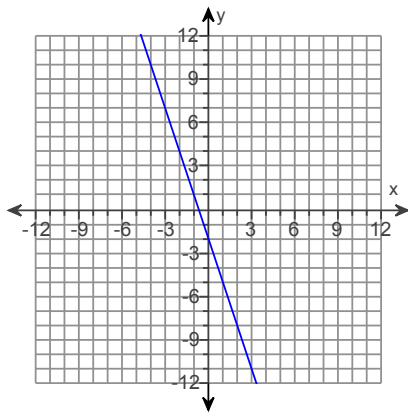
- A. $x \leq 19$
- B. All real numbers
- C. $x > \sqrt{19}$
- D. $x \neq 19$

15. Find the domain and the range for the function.



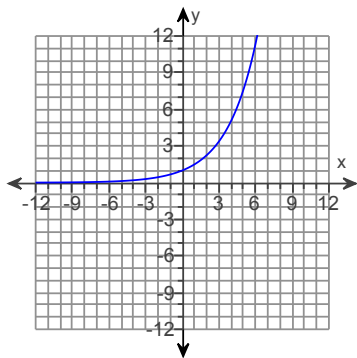
- A. D: $\{x \geq 2\}$, R: $\{y \geq 0\}$
- B. D: $\{x > 2\}$, R: $\{y \geq 0\}$
- C. D: $\{x > 0\}$, R: $\{y < 0\}$
- D. D: $\{x \geq 0\}$, R: $\{y \leq 0\}$

16. Is the relation is a function?



- Function
- Not a function

17. Is the relation is a function?



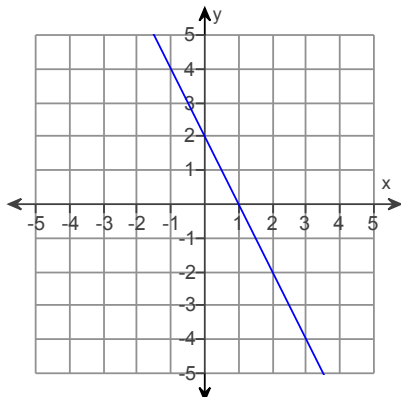
- Not a function
- Function

18. Find the slope of the line that goes through the pair of points.

$(-3, -6)$ and $(3, 5)$

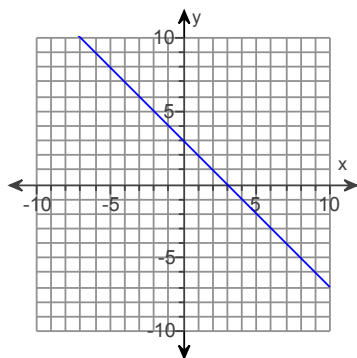
- A. 1
- B. $-\frac{11}{6}$
- C. $\frac{11}{6}$
- D. 11

19. Identify the slope, y-intercept, and x-intercept.



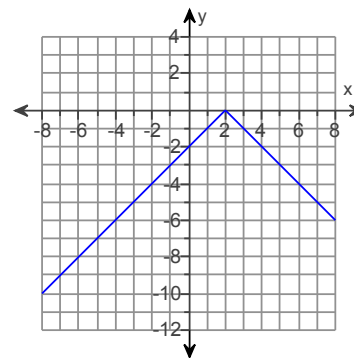
- A. Slope: 2; y-intercept: 2; x-intercept: 1
- B. Slope: 3; y-intercept: -2; x-intercept: -1
- C. Slope: -3; y-intercept: -2; x-intercept: -1
- D. Slope: -2; y-intercept: 2; x-intercept: 1

20. Write the equation of the line whose graph is shown.



- A. $y = x - 3$
- B. $y = x + 3$
- C. $y = -x + 3$
- D. $y = -x - 3$

21. Use the graph of f to determine the intervals where f is increasing and where f is decreasing.



- A. increasing: $(-\infty, 0)$; decreasing: $(0, \infty)$
- B. increasing: $(-\infty, \infty)$; decreasing: never
- C. increasing: $(2, \infty)$; decreasing: $(-\infty, 2)$
- D. increasing: $(-\infty, 2)$; decreasing: $(2, \infty)$

22. Compute the average rate of change of f from x_1 to x_2 . Round your answer to two decimal places when appropriate. Interpret your result graphically.

$$f(x) = 6x + 3, \quad x_1 = -6 \text{ and } x_2 = -3$$

- A. 6; the slope of the line passing through $(-6, f(-6))$ and $(-3, f(-3))$ is 6.
- B. 5; the slope of the line passing through $(-6, f(-6))$ and $(-3, f(-3))$ is 5.
- C. 7; the slope of the line passing through $(-6, f(-6))$ and $(-3, f(-3))$ is 7.
- D. 8; the slope of the line passing through $(-6, f(-6))$ and $(-3, f(-3))$ is 8.

23. Complete the following for the given $f(x)$.

(i) Find $f(x + h)$.

(ii) Find the difference quotient of f and simplify.

$$f(x) = -8x$$

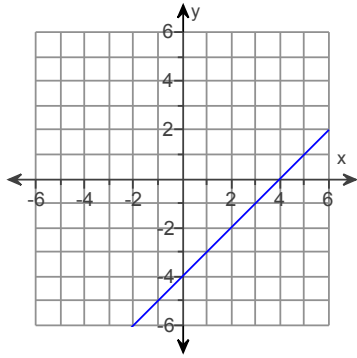
- A. (i) $-8x + 8h$
(ii) -8
- B. (i) $-8x + 8h$
(ii) 8
- C. (i) $-8x - 8h$
(ii) -8
- D. (i) $-8x - 8h$
(ii) 8

24. Find a point-slope form for the equation of the line satisfying the conditions.

Slope -5 , passing through $(6,3)$

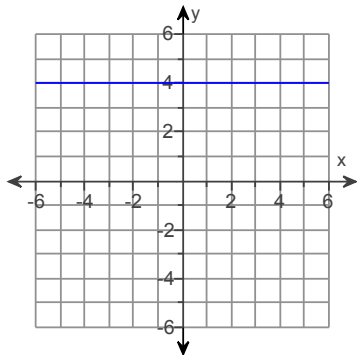
- A. $y = -5(x - 6) - 3$
- B. $y = -5(x - 6) + 3$
- C. $y - 3 = 5x - 6$
- D. $y - 3 = -5x + 6$

25. Write an equation in slope-intercept form for the line shown.



- A. $y = -x - 4$
- B. $y = x - 4$
- C. $y = x + 4$
- D. $y = -x + 4$

26. Write an equation in slope-intercept form for the line shown.



- A. $y = -4$
- B. $x = -4$
- C. $y = 4$
- D. $x = 4$

27. Write the slope-intercept form of the equation for the line passing through the given pair of points.

$(4, -4)$ and $(9, -4)$

- A. $4x + 9y = 0$
- B. $x = 4$
- C. $y = -4$
- D. $9x + 4y = 0$

28. Write the equation in slope-intercept form of the line through the given point with the given slope.

(2,4); slope: $-\frac{5}{8}$

- A. $y = -\frac{5}{8}x + \frac{4}{21}$
- B. $y = -\frac{5}{8}x + \frac{21}{4}$
- C. $y = -\frac{5}{8}x - \frac{21}{4}$
- D. $y = -\frac{8}{5}x - \frac{4}{21}$
-

29. Find an equation of the line satisfying the following conditions. If possible, write the equation in slope-intercept form.

Horizontal, passing through (6, -5)

- A. $y = 6$
- B. $x = -5$
- C. $y = -5$
- D. $x = 6$
-

30. Determine the x- and y-intercepts on the graph of the equation.

$y = 7(x + 3) + 1$

- A. x-intercept is $\frac{22}{7}$; y-intercept is -22
- B. x-intercept is $-\frac{22}{7}$; y-intercept is 22
- C. x-intercept is $-\frac{22}{7}$; y-intercept is -22
- D. x-intercept is $\frac{22}{7}$; y-intercept is 20
-

31. Determine the equation of the line described. Put the answer in the slope-intercept form, if possible.

Through (5, -5), perpendicular to $x = -4$

- A. $y = 5$
- B. $y = -5$
- C. $x = -4$
- D. $y = -4$
-

32. Find an equation of the line satisfying the following conditions. If possible, write the equation in slope-intercept form.

Horizontal, passing through $(3, -9)$

- A. $x = 3$
 B. $x = 9$
 C. $y = -9$
 D. $y = -3$
-

33. Solve the equation symbolically.

$$6(7x - 1) = 24$$

- A. $\frac{23}{42}$
 B. $\frac{25}{42}$
 C. $\frac{5}{7}$
 D. $\frac{3}{7}$
-

34. Classify the equation as a contradiction, an identity, or a conditional equation.

$$3(20t + 8) = 12(2t + 8)$$

- A. Contradiction
 B. Conditional
 C. Identity
-

35. Classify the equation as a contradiction, an identity, or a conditional equation.

$$-4s + 13 + 2(2s - 4) = 0$$

- A. Identity
 B. Contradiction
 C. Conditional
-

36. Solve the inequality symbolically. Express the solution set in interval notation.

$$-11z + 11 > -12z + 13$$

- A. $(24, \infty)$
 B. $(2, \infty)$
 C. $(-\infty, 2)$
 D. $(-\infty, 24)$
-

37. Solve the inequality symbolically. Express the solution set in interval notation.

$$24x - 12 > 4(5x - 11)$$

- A. $(24, \infty)$
- B. $(-8, \infty)$
- C. $(-\infty, -8)$
- D. $(-\infty, 24)$

38. Solve the inequality symbolically. Express the solution set in interval notation.

$$2 < 2x + 10 \leq 10$$

- A. $(0, -4]$
- B. $[0, -4)$
- C. $(-4, 0]$
- D. $[-4, 0)$

39. Solve the inequality graphically. Express the solution in set-builder notation.

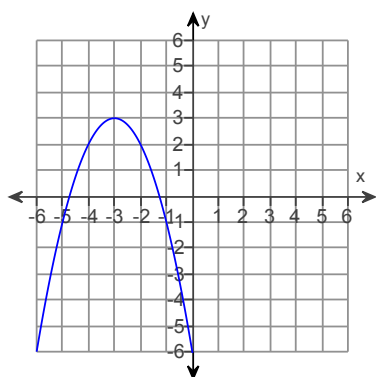
$$12x + 36 > 4(2x + 13)$$

- A. $\{x \mid x > 12\}$
- B. $\{x \mid x < 12\}$
- C. $\{x \mid x < 4\}$
- D. $\{x \mid x > 4\}$

40. In a certain city, the cost of a taxi ride is computed as follows: There is a fixed charge of \$2.10 as soon as you get in the taxi, to which a charge of \$1.55 per mile is added. Find an equation that can be used to determine the cost, $C(x)$, of an x -mile taxi ride.

- A. $C(x) = 1.55 + 2.10x$
- B. $C(x) = 2.10 + 1.55x$
- C. $C(x) = 3.65x$
- D. $C(x) = 2.15x$

41. Use the graph of the quadratic function to determine the sign of the leading coefficient, the vertex, and the equation of the axis of symmetry.



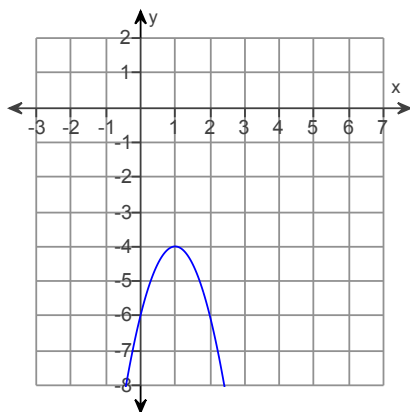
- A. Positive; $(3, 3)$; $x = 3$
- B. Negative; $(-3, 3)$; $y = 3$
- C. Negative; $(-3, 3)$; $x = -3$
- D. Positive; $(-3, 3)$; $x = -3$

42. Find the difference quotient for the function and simplify it.

$$g(x) = 7x^2 + 11x - 9$$

- A. $14x + 11 + 7h$
 B. $14x + 11$
 C. $14xh + 11h + 11h^2$
 D. $7x + 6 + 14h$

43. Use the given graph of the quadratic function f to write its formula as $f(x) = a(x - h)^2 + k$.



- A. $f(x) = -\frac{1}{2}(x + 1)^2 - 4$
 B. $f(x) = -(x - 1)^2 - 4$
 C. $f(x) = -2(x - 1)^2 - 4$
 D. $f(x) = -\frac{1}{2}(x - 1)^2 - 4$

44. Determine the vertex of the graph of f .

$$f(x) = 3x^2 - 12x + 7$$

- A. $(5, -2)$
 B. $(-5, 2)$
 C. $(2, -5)$
 D. $(-2, 5)$

45. Write the equation as $f(x) = a(x - h)^2 + k$. Identify the vertex.

$$f(x) = x^2 + 3x + 1$$

- A. $f(x) = (x + 3)^3 - 9; (-3, -9)$
 B. $f(x) = \left(x + \frac{3}{2}\right)^2 - \frac{5}{4}; \left(-\frac{3}{2}, -\frac{5}{4}\right)$
 C. $f(x) = (x + 3)^3 - 9; (3, -9)$
 D. $f(x) = \left(x + \frac{3}{2}\right)^2 - \frac{5}{4}; \left(\frac{3}{2}, -\frac{5}{4}\right)$

46. Solve the quadratic equation.

$$4x^2 = 28$$

- A. $\pm\sqrt{7}$
- B. 8
- C. ± 7
- D. No real solutions

47. Solve the quadratic equation.

$$7x^2 + 10x = -2$$

- A. $\frac{-5 \pm \sqrt{11}}{14}$
- B. $\frac{-5 \pm \sqrt{11}}{7}$
- C. $\frac{-5 \pm \sqrt{39}}{7}$
- D. $\frac{-10 \pm \sqrt{11}}{7}$

48. Solve by completing the square.

$$x^2 + 8x = 5$$

- A. $-4 \pm \sqrt{21}$
- B. $4 + \sqrt{21}$
- C. $-4 \pm 2\sqrt{21}$
- D. $-1 \pm \sqrt{21}$

49. Solve the following equation.

$$w^2 + 7w - 18 = 0$$

Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice.

- A. The solution(s) is/are $w =$.
(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)
- B. There are no real solutions.

50. Solve the following quadratic equation. Check your answers.

$$x^2 - 4x + 4 = 0$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A.** The solutions is/are $x =$. (Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)
- B.** There are no real solutions.

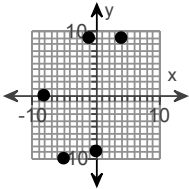
1. B. 38.5

2. D. 209

3. C. $D = \{12, 5, 4, -5, -3\}$; $R = \{-6, 7, -7, 2, -4\}$

4. D. $D = \{-5, 2, 4, -2\}$; $R = \{2, 5, -6, -3\}$

5.



D.

6. A. 10.82

7. A. $(-4, 4)$

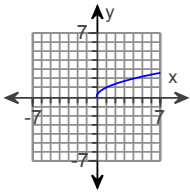
8. A. Center: $(0, 7)$, radius = 2

9. C. $(-3, 8)$, $r = 8$

10. B. $x^2 + y^2 = 64$

11. A. $(x + 2)^2 + (y - 5)^2 = 6$

12.



D.

13. A. $\sqrt{17}$

14. A. $x \leq 19$

15. A. D: $\{x \geq 2\}$, R: $\{y \geq 0\}$

16. Function

17. Function

18. C. $\frac{11}{6}$

19. D. Slope: -2 ; y-intercept: 2 ; x-intercept: 1

20. C. $y = -x + 3$

21. D. increasing: $(-\infty, 2)$; decreasing: $(2, \infty)$

22. A. 6 ; the slope of the line passing through $(-6, f(-6))$ and $(-3, f(-3))$ is 6 .

23. C. (i) $-8x - 8h$ (ii) -8

24. B. $y = -5(x - 6) + 3$

25. B. $y = x - 4$

26. C. $y = 4$

27. C. $y = -4$

28. B. $y = -\frac{5}{8}x + \frac{21}{4}$

29. C. $y = -5$

30. B. x-intercept is $-\frac{22}{7}$; y-intercept is 22

31. B. $y = -5$

32. C. $y = -9$

33. C. $\frac{5}{7}$

34. B. Conditional

35. B. Contradiction

36. B. $(2, \infty)$

37. B. $(-8, \infty)$

38. C. $(-4, 0]$

39. D. $\{x \mid x > 4\}$

40. B. $C(x) = 2.10 + 1.55x$

41. C. Negative; $(-3, 3)$; $x = -3$

42. A. $14x + 11 + 7h$

43. C. $f(x) = -2(x - 1)^2 - 4$

44. C. $(2, -5)$

45. B. $f(x) = \left(x + \frac{3}{2}\right)^2 - \frac{5}{4}; \left(-\frac{3}{2}, -\frac{5}{4}\right)$

46. A. $\pm\sqrt{7}$

47. B. $\frac{-5 \pm \sqrt{11}}{7}$

48. A. $-4 \pm \sqrt{21}$

49. A. The solution(s) is/are $w = \boxed{2, -9}$.

(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

50. A.

The solutions is/are $x = \boxed{2}$. (Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)
